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It was voted that the Treasurer be authorized, with the advice of the Finance Committee, to borrow a sum not exceeding three thousand dollars, in anticipation of the income of the present year.

It was voted to proceed to the election of the third member of the Committee of Finance, who was not chosen at the last election.

The ballot resulted in the election of Mr. T. T. Bouvé.

It was voted to omit the Stated Meeting in August, and to hold it on the second Tuesday in September.

Professor Winlock made a communication on a method of viewing, with the spectroscope, the whole sun at once, with the protuberances. He used a telescope of six inches focal length, giving an image of the sun about $\frac{1}{20}$ of an inch in diameter. The centre of this image was eclipsed by a small brass pin in a plate of glass, which replaced the slit. A thin annulus was thus received into the collimator of the spectroscope. He next tried a simple spot of silver on the glass, also silvering the latter, and cutting a circle in it. The image thus formed should be magnified with a telescope of considerable power after dispersion by the prisms. By using silvered specula and a heliostat, it would be found practicable to employ a spectroscope of very high dispersive power.

Six hundred and thirty-fifth Meeting.

September 13, 1871. — ADJOURNED STATED MEETING.

The PRESIDENT in the chair.

The President announced the death of Professor Immanuel Bœkker, Dean Mansel, Sir J. F. W. Herschel, and Mr. George Grote, of the Foreign Honorary Members; Dr. Holbrook, of the Associate Fellows; and Mr. Charles Jackson, of the Resident Fellows.

Professor Whitney made a communication on some experiments he has been conducting on the use of the barometer in the determination of elevations. He showed that, after applying all the known corrections, a residual error remained, owing to which observations made in winter sometimes gave results a hundred feet lower than those made in summer.

Remarks on this communication were made by the President, and Messrs. L. Agassiz, B. Peirce, and T. M. Brewer.

Professor E. C. Pickering showed a new application of Fresnel's formula of Reflection.

If i and r are the angles of incidence and refraction, and A and B the magnitudes of the two reflected beams polarized at right angles, we have $A = \frac{\sin^2(i-r)}{\sin^2(i+r)}$ and $B = \frac{\tan^2(i-r)}{\tan^2(i+r)}$. If in these we make the index of refraction $= 1 + dn$ or very nearly unity, we obtain by differentiating and reducing $A = \frac{dn^2}{4}(1+\text{tang}^2 i)^2$ and $B = \frac{dn^2}{4}(1+\text{tang}^2 i)^2$.

Substituting in these formulas different values of i we compute the accompanying table. The first column gives i, the second A or more strictly $(1+\text{tang}^2 i)^2 = \frac{1}{\cos^4 i}$. The third column gives B or the amount of light polarized in the plane of incidence; the fourth $\frac{1}{2}(A+B)$ the total light reflected, and the fifth $\frac{A-B}{A+B} \cdot 100$, or the degree of polarization in percentages. It will be noticed that at 45° the polarization is complete. Now the light of the sky may be accounted for, if we suppose the sunlight specularly reflected by very minute surfaces of air or aqueous vapor, the index of refraction in this case being very near unity. Our table then shows that the light should increase from the antisolar point towards the sun, becoming very great near the latter. At a distance of 10° the angle of incidence would be $\frac{180 - 10^\circ}{2} = 85^\circ$, and the light over 17,000 times as great as opposite the sun. Again, the polarization would attain its maximum 90° from the sun. These phenomena are quite in accordance with the observed facts.

i	A	B	$\frac{1}{2}(A+B)$	$\frac{A-B}{A+B}$
0	1.00	1.00	1.00	00.0
10	1.06	.94	1.00	6.2
20	1.28	.75	1.02	26.0
30	1.78	.44	1.11	60.0
40	2.90	.09	1.50	94.5
45	4.00	.00	2.00	100.0
50	5.86	.18	3.02	94.1
60	16.00	4.00	10.00	60 0
70	73.08	42.88	57.98	26.0
80	1099.85	971.21	1035.53	6.2
85	17330.64	16808.08	17069.36	1.2
90	∞	∞	∞	